

Communicating Risk in Major Incidents: the Public's Perception

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ABSTRACT: There are many examples of unpredicted natural and man-made disasters occurring over the past few decades, for example Hillsborough (1989) and the 7/7 Bombings (2005). Most of these incidents led to legislative reform to either improve infrastructure or the operational response, in an attempt to minimise future risks. However, suggested changes have not taken into consideration how to manage and communicate risk to the public. This is despite the impact that ineffective risk communication could have on both potential casualties and the environment. For example, during the Fukushima accident (2011) people were evacuated from light radioactive areas and ended up in more heavily contaminated areas, partly due to poor risk communication (Robertson et al., 2012). In order to investigate the current status of acceptance from the public when receiving risk information in an emergency, a large-scale live multi-agency training event was developed. This event was based on a ferry collision, which resulted in the release of a potential contaminant, requiring members of the public to undergo mass decontamination. Data was collected using questionnaires and conducting post incident debriefs with a total of 53 members of the public who played the role of 'passengers' on-board the ferry. Data was analysed using a combination of qualitative and quantitative methods. Findings indicate that the operational element was accepted, and often praised, but participants had problems with the non-technical side of the response, particularly the communication; this had a significant impact on the perception of the services involved. It is recommended that there is more frequent, clear and direct communication given to the public throughout a disaster as it will potentially increase the level of compliance and reassurance, and will reduce anxiety. This will benefit the agencies involved as effective communication has been found to increase trust and promote future confidence in agencies (Carter et al., 2013). This research has future implications for policy making, disaster management, and improving risk communication to members of the public.

Over the past few decades there have been many major incidents, which are defined by the Association of Chief Police Officers (pg.13, 2009) as, '*any emergency that requires the implementation of special arrangements by one or more of the emergency services, and generally includes the involvement, either directly or indirectly, of large numbers of people*'. Whether

natural or man-made all have been unpredictable, unexpected and have had disastrous consequences. For example, the Hillsborough disaster (1989) resulted in the death of 96 people and led to a public enquiry in which recommendations were made to improve the design and structure of football stadiums (Lord Justice Taylor, 1989). In 2005, the 7/7 bombings

saw the alteration of the Terrorism Act, and the Buncefield fire led to suggested improvements concerning the operation of fuel storage sites (Major Incident Investigation Board, 2007).

The majority of post incident recommendations centre on improving the infrastructure or operational response in order to prevent reoccurrence. Although these recommendations are beneficial, disasters are unlikely to occur in exactly the same way again. However, managing the public will always be something which is necessary in any major incident, especially as they frequently behave in ways which are undesirable, unanticipated and may have disastrous but avoidable consequences (Mintz, 1951).

For example, in the King's Cross underground fire (1987) victim's actions were consistent with the usual rules they would follow in that setting, showing learnt behaviour which had not been adapted in the fire. It was found that the majority of victims had attempted to exit the burning station via the same route they entered or by the exit they had originally planned to depart from; this behaviour was a contributing factor to the 31 deaths in this incident (Donald & Canter, 1992). The location of the bodies also indicated that there was some structure in the sequence of actions from the victims, albeit inappropriate, therefore contradicting the common assumption that the public panic and act irrationally in an emergency (Donald et al, 1992). If the commuters had been given clear and direct information to inform them of what to do in this unusual situation they would have understood how to behave and the consequences may have been different.

Furthermore, there is evidence that individuals under duress exhibit cognitive problems (Leach & Ansell, 2008; Porter & Leach, 2010). This impairment could in turn limit an individual's ability to undertake actions to mediate the impact of the threat; making flexible interaction difficult (Porter et al, 2010). This could result in a victim who is cognitively unable to aid their own survival (Leach, 1994).

Therefore verbal direction given by emergency responders, and potentially physically, is vital in order to lead people to safety. However, responders are often highly trained when it comes to the operational elements of a major incident response but are not trained to the same standard when it comes to managing the public's unexpected actions with effective risk communication (Robertson & Pengilly 2012).

The purpose of risk communication is to influence people to avoid dangers and to encourage co-operative planning; this is essential in a major incident (Hilton, 2008). Unfortunately, this is not always carried out effectively, the Fukushima nuclear accident (2011) is an example of this. Many of the unexposed people in Japan could have been managed by effective communication; instead it was reported that the responsible agencies repeatedly played down the risks of the affected areas, causing people to evacuate from low affected to more highly affected risk areas (Robertson et al, 2012). This dysfunctional public response of mass self-evacuation possibly contributed to the death toll of over 15,000 people (Robertson et al., 2012).

Although incidents as serious as Fukushima are infrequent, nuclear energy companies still have to work harder when interacting with the public in order to change negative perceptions and to gain acceptance (Gamson & Modigliani, 1989). This is supported by findings, which indicate that effective communication could increase trust and confidence in agencies (Carter, Drury & Rubin, 2012). Emergency responders' interactions have also been found to affect the public's experience and compliance with decontamination procedures; failure to communicate effectively can lead to anxiety about the process (Carter et al, 2012).

This article reports the findings from a simulated major incident in which members of the public acted as casualties. The aim of this research is to explore how casualties rate the emergency service response and communication given to them in a major incident.

1. METHODOLOGY

1.1.1. *The exercise: KMAF Warrior*

Operation KMAF Warrior was a large-scale multi-agency training event that took place on 6th March 2014. The exercise scenario involved a ferry colliding with another vessel, resulting in the dispersal of an unknown white powder that was a potential contaminant to ferry passengers, played by participants. This meant that people on board the vessel had to undergo mass decontamination.

Agencies involved in this exercise included a ferry company, the Fire and Rescue Service, the Police, the Hazardous Area Response Team, the Red Cross, St John's Ambulance, a travel company, National Health Service representatives, the Coastguard, local media, local councils and the Environmental Agency.

1.1.2. *Participants*

There were approximately 70 people who acted as casualties in this exercise, although only 53 people participated in this research. Participants were aged between 18 and 59, with a mean age was 23, and they were predominantly female (40/53). The majority of participants were students from the University of Liverpool (44/53) and the rest of the participants were from external agencies such as Red Cross. Role players were unaware of the exercise scenario and were only told that they would be going on a ferry; this presented a level of realism for them and the emergency services throughout the exercise.

1.1.3. *Measures*

Pre event questionnaires were completed 4 weeks prior to the event and post event questionnaires were completed immediately following the event. Questionnaires were chosen as they do not require the presence of skilled researchers, allowing information to be gathered on specific topics and requiring less time to complete than interviews (Crandall, Klein & Hoffman, 2006). Questionnaires asked a range of questions that required quantitative responses, which allowed direct comparisons to be made

between perceptions pre and post event in order to identify whether they altered. In both questionnaires, participants were asked to score their agreements from 1-10 (1=Strongly Disagree, 10=Strongly Agree) to a set of statements. Qualitative questions were also included in order to provide a rationale for the scores given (Guest, Namey, & Mitchell, 2013). This mixed method approach was utilized as it provides a better understanding of the research problem (Guest et al., 2013).

In addition to questionnaires, the majority of participants took part in a post-event debrief, which allowed participants to explore concepts and discuss certain aspects of their experiences with one other. Debriefs lead people through a series of questions that allow them to reflect on a recent experience in a non-punitive environment; they also encourage people to construct their own meanings for their actions and aids in them identifying lessons for the future (Tannenbaum & Cerasoli, 2013).

1.1.4. *Analytical procedure*

As the questionnaires had a mixture of quantitative and qualitative questions they were analysed in two ways. Firstly, T-tests were conducted on the quantitative data using SPSS to identify whether perception ratings of emergency services significantly altered pre and post event (Field, 2009). Secondly, qualitative responses to open-ended questions were analysed using a thematic framework as this flexible approach allows data to be described in rich detail and is particularly useful for investigating data when the participant's ideas are unknown, as with this exploratory study (Braun & Clarke, 2006).

Debriefs were all recorded and transcribed before also being analysed using a thematic approach; this allowed codes to be generated in a systematic fashion across the entire dataset (Braun & Clarke, 2006). Furthermore, a check of inter-rater reliability was carried out on these themes, which revealed an 86% agreement between the researchers and a colleague; indicating a high level of agreement.

2. RESULTS

2.1. Quantitative analysis

See Table 1 for full results. Following the exercise, participants had significantly less trust and confidence in the fire and rescue service, although it was still relatively high. There was also a decrease in the confidence people had in the ambulance service and police post exercise however these findings were not statistically significant. Overall, the public had the least trust in police both pre and post incident compared to the other two emergency services.

Results indicated that after the exercise there was a significant decrease in the extent to which people felt their concerns were understood by the emergency services and people were significantly less satisfied with the amount of information the emergency services share with the public. Furthermore, after the exercise people felt they would comply to a greater extent with instructions given by the emergency services, there was an increase in preferences to know emergency service procedures and people were more certain of how emergency services respond in disasters; however none of these results were found to be statically significant.

2.2. Qualitative analysis

In total, 372 quotes (6955 words), approximately 30% of the whole data set, were identified and

extracted. From this data 4 themes were identified: communication (144 quotes = 38.7%), perception of agencies (140 quotes = 37.6%), cost vs benefit of participation (63 quotes = 16.9%) and experienced emotions (25 quotes = 6.7%). A description of the themes, along with examples of quotes can be found below.

2.2.1. Communication

A lack of communication was undoubtedly the most prevalent theme to emerge throughout the data set. People reported a lack of communication at all stages of the exercise although this was more predominant when undergoing mass decontamination. Even though the procedure was potentially challenging, as it involved undressing, people often praised the procedural elements of it. However the lack of communication and verbal instructions given was a common criticism:

'...I just think communication was really bad. Apart from that it was all really good.'

This lack of communication had many implications for passengers such as feeling confused and uninformed:

'Communicate with people and tell them what is going on because it was not enjoyable being left in the dark'

Table 1: Pre and post exercise comparisons (1= strongly disagree, 10= strongly agree)

Statements	Pre event		Post event		df	t	sig (2 tailed)*
	Mean	SD	Mean	SD			
I trust the Fire and Rescue Service	9.33	0.96	8.39	2.05	35	2.69	0.01
I have confidence in the Fire and Rescue Service	9.25	0.94	8.33	2.09	35	2.51	0.02
I would comply with instructions given by the emergency services	9.22	1.27	9.03	1.91	35	0.50	0.60
I trust the Ambulance Service	9.19	0.92	9.58	2.02	35	1.73	0.09
I have confidence in the Ambulance service	9.00	1.04	8.28	2.40	35	1.67	0.10
I feel the emergency services understand my concerns	9.03	0.77	6.58	2.77	35	5.79	0.01
I have confidence in the Police	8.61	0.90	8.03	1.83	35	1.90	0.07
I trust the Police	8.53	0.91	7.86	2.27	35	1.74	0.09
I prefer to know the procedures of the emergency services	8.00	1.47	8.72	2.01	35	-1.89	0.68
I am happy with the amount of information the emergency services share with the public	7.67	1.22	5.64	2.24	35	5.60	0.01
I know how the emergency services respond in disasters	7.19	1.56	7.61	2.36	35	-0.89	0.38

*Sig <0.05

This also had physical implications, such as people not wearing the protective clothing correctly; although it is uncertain if this was non-compliance with procedures was on purpose or through the perceived lack of direction.

'People didn't have their masks on'

It was reported in this exercise that people did not follow instructions given to them. Whether done on purpose or not, non-compliance in a real incident would be a serious issue which could cause more harm:

'Well I didn't wipe my face or blow my nose'

Furthermore, not being given enough information caused people to imitate other people's behaviour; this is also a concern as it would be easy for people to copy incorrect actions or behaviours which again could cause further contamination in a real incident. However, in this case it worked in favour of the responder as people seemed to copy the correct behaviours:

'Once inside we were given relatively little information on what to do next but people began to put on the suits provided in the packs so I followed suit'

The problems with communication could have been rectified by communicating more frequently with casualties, even if it means responders repeating themselves or using a loud hailer. This is further supported by questionnaire responses in which people reported that challenges could be overcome by more frequent communication as well as clearer instructions and guidance. Although they were sometimes criticised for their operational response, the Ferry Service received praise for trying to consistently interact with people on board the Ferry:

'They actually gave information on the ferry. They hadn't a clue what they were doing but at least they were trying to tell you something...'

This highlights the fact that more communication is beneficial for the people and

the perception of the service, it also links to the following theme.

2.2.2. Perception of agencies

The way people felt about the involved was a common theme to emerge in this study; some participants perceived their task to be to evaluate the performance of these agencies. It is useful to know what the public perceptions of agencies are as it highlights what factors people value about the service and provides clear suggestions for improvement. Although it is important to notice that this differs from person to person:

'I feel that it was fun but if anything I have less confidence in the emergency services'

'Everything went smoothly, the members of the emergency services were confident, they were able to do everything with control.'

Authority was a factor that appeared to affect how people regarded the agencies involved. Being authoritative was a preference of the public; agencies not giving orders and allowing members of the public to dictate their actions seemed to impact on how they were perceived:

'It would have been nicer had they made orders and stuck to them...'

'The staff shouldn't rely on the medical, just because they say they are medical students, you know, they might be first year. So, I thought that was a bit questionable.'

Members of the public also noted that they were often unsure of which agencies the practitioners they encountered was a part of. Although agencies were wearing uniforms on the day, it may be that these were not particularly clear, especially the uniforms which were required for the decontamination. In this exercise, it may have caused people to attribute negative perceptions to the wrong agencies. Furthermore, in a major incident it is important that people know which agency is which so they can ask for the correct help:

'Who are the people in green?'

People often compared this exercise to a real emergency and seemed to believe that the agencies would not make the identified mistakes in a real emergency. This is also a good way to inadvertently understand what improvements participants would like to see being made. For example:

'... [If real] they would be telling ya what too. Well I hope that they would.'

It is also apparent that members of the public want the emergency responder dealing with them in an emergency to do the best that they can do. If the public were not happy with certain aspects of the response, they still tried to see the good side of the emergency responders and defended the actions of that agency. The most common defence was that it was because it was a training exercise; however in a real emergency the public would not have this defence.

'I don't think it was their fault, they just need to be trained'

'...maybe if it was a real thing they would react differently'

2.2.3. Cost vs Benefits of participation

Throughout the data set there are numerous references to the costs and benefits of taking part in this exercise. Although this is a theme that is difficult to generalise to a real emergency, it demonstrates what should be considered in a real emergency in order to keep people satisfied.

Many people stated that waiting an unnecessary amount of time on the Ferry and again before going through the decontamination was unacceptable. Another problem that people had with taking part was the lack of urgency; this led to a decreased level of realism in the exercise. Members of the emergency services not taking it seriously made it difficult for the participants to play distressed passengers realistically as in a real emergency they would expect responders to have some urgency:

'So erm...yeah then we were kind of waiting around to be decontaminated. It wasn't very

urgent, it wasn't as if it was an emergency, it was just like we were waiting for something...'

It is also important to point out that some participants did not take the event seriously too. Conversely, certain participants affected the experience by taking their role too seriously and dictating to others.

'The 5th year medical students, they were like really dominating what was going on. They were even giving instructions to like the fire-fighters'

The most common benefit seemed to be what people learnt on the day; a lot of people appreciated learning the decontamination procedure as well as how people work and interact in an incident. This was also the most prevalent answer on the questionnaire.

'The overall exercise was a great experience helping me to learn about decontamination procedure and the emergency services. It also helps you understand what a real event like this would be like.'

2.2.4. Experiencing emotions

People experiencing real emotions is another important theme to emerge as it proves how realistic this event was and gives an indication of what can be expected in a real incident. Accordingly, this suggests that the findings of the present study may be generalizable to real emergencies as experiencing real emotion indicates that the exercise was realistic.

As highlighted in the previous theme, many people enjoyed taking part in the exercise and so experienced positive emotions such as excitement:

'It was exciting and at many points it was realistic and sometimes even real emotions got evoked in me'

Uncertainty was repeatedly experienced by people but for different reasons. This feeling of uncertainty could be greatly reduced by keeping people informed and communicating with them so they know what is going on, this is evident throughout the questionnaire where people

openly state they felt confused or unsure of what to do.

'I kind of feel like, I felt like it was one really confusing assault course and I feel like in an emergency you shouldn't feel like you'd just gone through an assault course'

3. DISCUSSION

This study took a novel approach to gain an in depth insight into the experiences of casualties during a major incident, the communication they received and the impact that the response may have had on agencies. It is hoped that work in this area can aid in improving emergency service response in a major incident. The overarching finding of this study was that emergency responders, and other agencies in contact with the public, do not communicate with casualties effectively or sufficiently. A lack of effective communication was consistently found in the questionnaires and during the post-event debrief; this had an impact on the participants' perception of the agencies involved.

The findings from this study, in the themes of 'communication' and 'perception of agencies' in particular, highlight the negative impact that inadequate communication can have on an agency's reputation. There was also a decrease in the scores of trust and confidence in the agencies that did not communicate well. Furthermore, inadequate communication made the participants anxious and uncertain. This outcome suggests that improving communication is a key consideration that needs to be made by agencies. This also supports other research which states that agencies rarely train in the human element of the response (Robertson et al, 2012).

Furthermore, people were not complying with procedures by not wearing the uniform correctly or following instructions. Although it is unknown if this was an intentional action or whether people genuinely did not know what to do, it still indicates that non-compliance is a possibility if communications are not clear and direct. This is something that needs addressing because in a real emergency involving a

contaminant this could cause further harm. This supports previous research, which has found a positive correlation between effectiveness of communication and conformity (Carter et al., 2012).

Improving communication is also necessary as emergencies are rare and casualties don't know how to best behave appropriately unless the correct information is given to them clearly and timely (Donald et al, 1992) as well as clearly and directly (Leach, 1994). If this were a real incident not telling people that they had to undergo decontamination could have had serious implications as people may have left the terminal still contaminated and so dispersing the potentially dangerous chemical further. Additionally, people actually requested this type of information and so it supports the necessity of sufficient communication.

It is important to note that this data was taken from just one exercise and so findings may be specific to this group of people; therefore it needs to be replicated with other agencies to confidently generalise findings. Furthermore, Carter et al (2012) has found that communication is problematic in mass decontaminations in general and so it would be useful to repeat the study using a different exercise scenario. Findings could also be different in a real major incident as this was only a training exercise.

4. CONCLUSIONS

The findings presented in this study support the idea that responding services need to be trained in how to effectively communicate risks to members of the public during major incidents. They need to be clear and direct with members of the public in order to ensure instructions are followed. It also proved that effective communications can benefit the agencies as casualties will feel more reassured and less uncertain; this can positively impact how people feel about the agency post incident. As found in the study, members of the public have high expectations for emergency responders and want them to be the best that they can be.

Even though this was a rare approach to data collection, the intention to study people's perceptions in order to improve outcomes in disasters is not unusual as this was studied over 60 years ago (Mintz, 1951) but unfortunately lessons have not been learnt. In this exercise no grievous harm was caused but real incidents are still occurring where people are making the same mistakes. However, agencies involved in this exercise have given some members of the public an opportunity to understand what it would be like to be part of an emergency which can help their cognitive processing if it were to happen for real (Donald et al, 1992). Furthermore, it is hoped that recommendations made will be taken on board by the people involved to avoid the similar mistakes occurring for real as the consequences can be fatal.

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